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BOTANICAL GAZETTE

JUNE, 1903

CRATAEGUS IN NORTHEASTERN ILLINOIS.

C. S. SARGENT.

THIS paper is based chiefly on the large collections and on the notes made in the neighborhood of Chicago, by Mr. E. J. Hill, of that city, during the last four years. Mr. William C. Egan, of Lake Forest, Mr. Robert Bebb, of Chicago, Mr. H. C. Skeels, of Joliet, and Mr. B. T. Gault, of Glen Ellyn, have also made important collections of *Crataegus* in this region. The field, however, is by no means exhausted, and there are indications in all these collections of forms which cannot now be described for want of fuller information.

CRUS-GALLI.

Stamens 10.*Anthers* rose color.

CRATAEGUS PEORIENSIS Sargent, BOT. GAZ. 31: 5. 1901; Silva N. Am. 13: 45. *pl.* 640.

Joliet, E. J. Hill, June and October 1901, May and September 1902; H. C. Skeels, May 1902.

Anthers pale yellow.

Crataegus Arduennae, n.sp.—Glabrous. Leaves obovate, acute, acuminate or rounded at the apex, gradually narrowed from near the middle to the entire cuneate base, finely crenately serrate above, with glandular teeth; deeply tinged with red as they unfold and nearly fully grown when the flowers open; at maturity subcoriaceous, dark green and very lustrous on the upper surface, pale on the lower surface, 4.5–6^{cm} long, 1.5–3^{cm} wide, with slender yellow midribs and obscure primary veins mostly within the

parenchyma; petioles stout, grooved, winged below the middle by the decurrent base of the leaf-blades, occasionally sparingly glandular, 6–14^{mm} in length; stipules linear, dark red, minute, caducous; on vigorous shoots leaves usually elliptical, short-pointed, very coarsely serrate, usually laterally lobed, 6–7^{cm} long, 4–5^{cm} wide, with stout midribs and prominent slender primary veins, their stipules foliaceous, lunate, coarsely glandular-serrate, stalked, sometimes 1.5^{cm} in length. Flowers 1.2–1.5^{cm} in diameter on long slender pedicels, in broad thin-branched many-flowered compound corymbs; bracts and bractlets linear, minute, caducous; calyx-tube narrowly obconic, the lobes abruptly narrowed from the base, linear, acuminate, tipped with small dark red glands, entire or rarely slightly and irregularly serrate, reflexed after anthesis; stamens 5–12, usually 10; anthers small, pale yellow; styles 1 or 2. Fruit on slender pedicels, in drooping many-fruited clusters, oblong, dull dark crimson marked by large pale dots, about 1^{cm} long, 8–10^{mm} wide; calyx small, sessile, with a narrow shallow cavity and reflexed and appressed lobes; flesh thin, yellow, dry and mealy; nutlet 1, gradually narrowed from the middle to the obtuse ends, grooved and irregularly ridged on the dorsal face; or 2 and then broad, rounded at the ends, prominently ridged on the back with a high wide rounded ridge, about 8^{mm} in length.

A shrub 3–4^m tall with numerous erect stems and branches covered with smooth light gray bark, and slender slightly zigzag branchlets, light orange-green and marked by small pale lenticels when they first appear, dark purple and lustrous at the end of their first season, dark grayish-brown the following year, and armed with many slender straight or slightly curved dark purple shining spines 4.5–8^{cm} long. Flowers during the last week of May or early in June. Fruit ripens the middle of September.

Glen Ellyn, Du Page county, *B. F. Gault*, June 1901; rich clay loam in ravines near water or in depressions near the top of a clay hill, "Forest of Arden," Joliet, *E. J. Hill*, May and September 1902, *H. S. Skeels*, May 1902.

At Joliet Mr. H. N. Higginbotham has planned and planted a garden of three hundred acres. It is called the Forest of Arden, and here are to be brought together the trees and shrubs and other plants of the United States which can support the climate of Illinois. I am glad to adopt Mr. Hill's suggestion and associate with this thorn the name of the garden where it grows spontaneously.

PRUINOSAE.

*Stamens 20.**Anthers rose color.*

CRATAEGUS PRUINOSA K. Koch; Sargent, Silva N. Am. 13:68. *pl. 648.*

Barrington, May and September 1901, Highland Park, May and October 1902, Bremen, October 1901, May 1902, *E. J. Hill*; Lake Forest, September 1901, *W. C. Egan*; Milton, DuPage county, May and September 1902, *B. T. Gault*.

Anthers pale yellow.

CRATAEGUS CONJUNCTA Sargent, Rhodora 5: 57. 1903.

Mokena, May and October 1897, September 1898, May, September and October 1900, Highland Park, May and October 1902, Deerfield, May and September 1902, Bremen, May 1902, *E. J. Hill*; Highland Park, *W. C. Egan*, May and September 1901.

*Stamens 10.**Anthers rose color.*

CRATAEGUS DISSONA Sargent, Rhodora 5: 60. 1903.

Clay banks of Lake Zurich, and adjacent oak woods, *E. J. Hill*, September 9, 1895, May and September 1899, May and October 1901, *C. S. Sargent*, September 1899; gravelly banks of Salt Creek, La Grange, *E. J. Hill*, June and September 1902.

PUNCTATAE.

CRATAEGUS PUNCTATA Jacquin.

Common.

MOLLES.

*Stamens 20.**Anthers pale yellow.*

CRATAEGUS MOLLIS Scheele, Sargent, Silva N. Am. 13: 83. *pl. 659.*

Common.

CRATAEGUS SERA Sargent, Bot. Gaz. 33: 115. 1902; Silva N. Am. 13: 87. *pl. 661.*

Bottoms of the Desplaines and Calumet rivers, and Barrington.

Anthers rose color.

CRATAEGUS CORUSCA Sargent, Bot. Gaz. 33: 117. 1902; Silva N. Am. 13: 99. *pl. 667.*

Shores of Lake Zurich. Rare.

LOBULATAE.

*Anthers pink or rose color.**Stamens 5-10.*

Crataegus elongata, n. sp.—Leaves oblong-ovate, acuminate, rounded or concave-cuneate at the broad often unsymmetrical entire glandular base, finely doubly serrate above, with straight or incurved teeth tipped with small red glands, and very slightly divided into three or four pairs of acuminate lateral lobes; thickly coated above as they unfold with shining white hairs and villose below; more than half grown when the flowers open and then membranaceous, light yellow-green and still villose; at maturity thin but firm in texture, dark yellow-green, smooth and glabrous on the upper surface, pale yellow-green on the lower surface, 6–7^{cm} long, 4.5–5.5^{cm} wide, with stout midribs deeply impressed above and occasionally furnished with a few scattered hairs along their rose-colored base, and 5 or 6 pairs of slender primary veins extending to the points of the lobes; petioles very slender, wing-margined at the apex, slightly grooved, villose and sparingly glandular early in the season, 2.5–3^{cm} in length. Flowers on slender pedicels, thickly coated like the narrowly obconic tube of the calyx with long pale hairs, in very long thin-branched few-flowered villose corymbs; calyx lobes narrow, acuminate, glandular-serrate, glabrous on the outer, villose on the inner face, reflexed after anthesis; stamens five; anthers pale pink; styles 3 or 4. Fruit on elongated pubescent pedicels, in gracefully drooping few-fruited clusters, oblong-obovate, crimson, lustrous, marked by numerous small pale dots, about 1.5^{cm} long and 8^{mm} wide; calyx persistent, with a broad deep cavity and spreading and reflexed much enlarged lobes, their tips usually deciduous from the ripe fruit; flesh thick, dry and mealy; nutlets three or four, thin, gradually narrowed and acute at the apex, full and rounded at the base, ridged on the back, usually with a broad grooved ridge, 9–10^{mm} long.

A small tree with slender straight branchlets, dark orange-green marked by oblong pale lenticels and villose when they first appear, bright red-brown, glabrous or puberulous at the end of their first season, and dull dark gray-brown the following year, and unarmed or armed with stout, slightly curved

dark red-brown shining spines about 4.5^{cm} long. Flowers about the 20th of May. Fruit ripens the middle of September.

Deerfield, *William C. Egan*, May 21, 1902, *E. J. Hill*, September 10, 1902.

Well distinguished from the other described species of this group by the few-flowered corymbs, the long narrow small fruits, and the small leaves.

Crataegus sertata, n. sp.—Leaves oblong-ovate, acuminate at the apex, rounded, truncate, subcordate or rarely cuneate at the broad base, finely and often doubly serrate, with straight gland-tipped teeth, and deeply divided into five or six pairs of wide acuminate lobes; thickly coated on the upper surface when they unfold with short pale hairs and villose below along the midribs and veins, and about half-grown and villose when the flowers open; at maturity membranaceous, dark yellow-green and scabrate above, pale yellow-green and glabrous below, 6–7^{cm} long, 4.5–6.5^{cm} wide, with thin yellow midribs and slender primary veins arching obliquely to the points of the lobes; petioles slender, slightly grooved, villose early in the season, ultimately glabrous, sparingly glandular, 1.5–3^{cm} in length; stipules linear to lanceolate, finely glandular-serrate, caducous. Flowers 2–2.5^{cm} in diameter, in broad 10–15-flowered compound densely villose corymbs; bracts and bractlets linear to linear-obovate, glandular, large and conspicuous, caducous; calyx tube broadly obconic, glabrous above, villose below like the slender pedicel, the lobes abruptly narrowed from the base, broad, acuminate, tipped with small red glands, coarsely glandular-serrate, glabrate on the outer, pubescent on the inner surface, reflexed after anthesis; stamens 5–10, usually 5; anthers pale rose color; styles 3–5, surrounded at the base by tufts of pale hairs. Fruit on slender villose-pubescent pedicels, in drooping many-fruited clusters, subglobose to slightly obovate, full and rounded at the ends, bright red and lustrous, becoming darker or crimson when fully ripe, marked by occasional large pale dots, 1.1–1.5^{cm} long, from 1–1.4^{cm} wide; calyx sessile, with a broad deep cavity and enlarged mostly erect and incurved serrate lobes; flesh thin, yellow, aromatic, pleasantly acid; nutlets 3–5, usually 4, thin, narrowed and acute at the ends, slightly ridged on the back, with a wide or narrow ridge, 8^{mm} in length.

A tree 6–7^m in height with a trunk occasionally 2–2.5^m long and 1.5–1.8^{dm} in diameter, covered with close dark gray bark 6–7^{mm} thick, separating into long narrow thin plate-like scales, stout spreading branches forming a handsome open head, and slender nearly straight branchlets thickly coated when they first appear with matted pale hairs, light red-brown and lustrous at the end of their first season and dark gray-brown the following year, and unarmed or armed with stout nearly straight or curved spines from 2.5–6^{cm} long. Flowers from the 5th to the 15th of May. Fruit ripens about the middle of September and soon falls.

Open woods and pastures in rich moist soil, Barrington, May and September 1899, Mokena, September 1899, May 1900, May and September 1901, Glendon Park, May and September 1901, Lake Zurich, May and September 1901, *E. J. Hill*.

Stamens usually 20, rarely 10.

***Crataegus assurgens*, n. sp.**—Leaves broadly ovate, acuminate, rounded or rarely cuneate at the wide entire base, sharply doubly serrate above, with straight gland-tipped teeth and slightly divided into three or four pairs of small acuminate lobes; about one-third grown when the flowers open and then roughened above by short white hairs and glabrous or sparingly villose below along the midribs and veins with persistent hairs; at maturity membranaceous, dull dark green and scabrate on the upper surface, light yellow-green on the lower surface, 7–9^{cm} long, 6–7^{cm} wide, with slender yellow midribs and thin veins arching obliquely to the points of the lobes; petioles slender, slightly grooved, villose early in the season, becoming pubescent, 2.5–4^{cm} in length; stipules linear to linear-obovate, acuminate, glandular, caducous; on vigorous shoots leaves often deeply lobed, very coarsely serrate, sometimes 10^{cm} long and wide, with long stout glandular petioles and foliaceous lunate acuminate coarsely glandular-serrate persistent stipules. Flowers 1.8–2.2^{cm} in diameter on short villose pedicels, in rather compact 8–15-flowered thin-branched hairy compound corymbs; bracts and bractlets oblong, acuminate, often somewhat falcate, glandular, turning brown in fading, mostly deciduous with the opening of the flowers; calyx tube narrowly obconic, sparingly villose, the lobes long, narrow acuminate, tipped with minute red glands, finely glandular-serrate, glabrous on the outer, pubescent on the

inner face, reflexed after anthesis; stamens 10–20, usually 10; anthers pinkish purple; styles 4 or 5, surrounded at the base by tufts of pale hairs. Fruit on short stout glabrous pedicels, in drooping, few-fruited clusters, oblong to slightly obovate, dull red or crimson, 1.2–1.8^{cm} long, 1–1.5^{cm} wide; calyx sessile with a broad shallow cavity and spreading closely appressed serrate usually persistent lobes; flesh thin, pale yellow or nearly white, acidulous; nutlets 4 or 5, broad, acute at the ends, prominently ridged on the back, with a high narrow ridge, or often grooved, 6–7^{mm} in length.

A broad much-branched shrub 2–4^m tall, or more often and in better soil a tree with an oblong head rising sometimes to the height of 8^m and forming a trunk 2–3^m long and 0.5–1.5^{dm} in diameter, covered with close dark gray bark; branchlets slender, light orange-yellow, marked by pale lenticels and furnished with long scattered caducous white hairs when they first appear, bright red-brown and lustrous during their first season, and dull dark gray-brown the following year, and armed with many stout usually slightly curved bright red-brown shining spines 2.5–4^{cm} long. Flowers the middle of May. Fruit ripens from the 15th to the 20th of September and usually falls about the 1st of October or earlier, sometimes remaining on the branches until the middle of that month.

River banks and woods in rich soil, Leyden township, May and September 1900, 1902, La Grange, June and September 1902, Thatcher's Park, May, September and October 1901, May 1902, *E. J. Hill*.

***Crataegus magniflora*, n. sp.**—Leaves oblong-ovate, acute or acuminate, rounded or rarely cuneate at the broad entire base, coarsely doubly serrate above, with straight glandular teeth and slightly divided into numerous narrow acuminate lateral lobes; about half-grown when the flowers open and then membranaceous, light yellow-green and roughened by short white hairs and pale and glabrous below; at maturity thin but firm in texture, dark yellow-green and scabrate on the upper surface, paler on the lower surface, 6–7^{cm} long, 4–6^{cm} wide, with slender yellow midribs and thin primary veins extending obliquely to the points of the lobes; petioles slender, nearly terete, slightly grooved, puberulous early in the season, soon glabrous, 1.5–3.5^{cm} in length; stipules linear, acuminate, minute, bright red, caducous. Flowers 2.5–3^{cm} in diameter on long slender glabrous pedicels, in compact 7–10-flowered thin-branched glabrous corymbs; bracts

and bractlets linear to linear-oblong, acuminate, finely glandular-serrate, turning red before falling, mostly persistent until after the flowers open; calyx tube broadly obconic, the lobes gradually narrowed from the base, wide, acuminate, coarsely glandular-serrate, glabrous on the outer, slightly villose on the inner surface, reflexed after anthesis; stamens 20; anthers pink; styles 3-5, surrounded at the base by a narrow ring of pale tomentum. Fruit on slender rigid erect pedicels in few-fruited clusters, narrow, obovate at first when fully grown, becoming finally short-obovate to globose, full and rounded at the ends, dark crimson marked by few large pale dots, about 1.6^{cm} long and 1.4^{cm} wide; calyx sessile, with a broad shallow cavity and slightly enlarged erect and incurved lobes often deciduous from the ripe fruit; flesh thin, yellow, dry and mealy; nutlets three to five, usually four, thin, high and often gibbous in the middle, abruptly narrowed to the acute ends, usually prominently ridged, with a broad deeply grooved ridge, or rounded and slightly grooved on the back, about 8^{mm} long.

A bushy tree 6-7^m in height with slender nearly straight branchlets, dark orange-green and glabrous when they first appear, soon becoming dull orange or reddish brown and marked by many small pale lenticels, and darker grayish brown the following year, and slightly armed with stout straight or slightly curved dark red-brown spines about 3.5^{cm} in length. Flowers the middle of May. Fruit ripens from the 10th to the middle of September.

Borders of woods, in gravelly soil, Glendon Park, *E. J. Hill*, May, June, and September 1901.

Crataegus Hillii, n. sp.—Leaves oblong-ovate, acuminate, rounded or rarely cuneate at the broad entire base, coarsely doubly serrate above, with straight glandular teeth, and slightly divided into numerous short acuminate lateral lobes; when they unfold coated above with short lustrous white hairs and densely tomentose below particularly on the midribs and veins; about one-quarter grown when the flowers open and then roughened above by short hairs and still villose below; at maturity thin but firm in texture, light yellow-green and scabrate on the upper surface, pale yellow-green on the lower surface, 6-8^{cm} long, 5-6^{cm} wide, with slender midribs often slightly hairy near the

base, and 4 or 5 pairs of thin primary veins extending obliquely to the points of the lobes; petioles slender, slightly grooved, densely villose early in the season, 2.5–4^{cm} in length; stipules oblong, often falcate, coarsely glandular-serrate, villose, 7–8^{mm} long, usually persistent until the flowers have opened; on vigorous shoots leaves often truncate or slightly cordate at the base, deeply lobed with broad nearly triangular lobes, frequently 9–10^{cm} long and broad with stout rose-colored glandular petioles and villose lunate glandular-serrate stipules. Flowers 1.8–2^{cm} in diameter on slender densely villose pedicels, in broad many-flowered thin-branched hairy compound corymbs; bracts and bractlets, large, linear to oblong, acuminate, glandular with dark red glands, occasionally persistent until midsummer; calyx tube narrowly obconic, thickly covered with long spreading white hairs, the lobes abruptly narrowed at the base, broad, acuminate, coarsely glandular-serrate, glabrous on the outer, villose on the inner face; stamens 20; anthers pink; styles 4 or 5, surrounded at the base by a narrow ring of pale tomentum. Fruit drooping on slender puberulous pedicels, in few-fruited clusters, obovate, full and rounded at the apex, gradually narrowed to the rounded base, crimson, lustrous, marked by small dark dots, 1.4–1.6^{cm} long, 1–1.2^{cm} wide; calyx sessile, with a broad shallow cavity and slightly enlarged closely appressed coarsely serrate lobes often deciduous from the ripe fruit; flesh yellow, thin, acidulous, juicy; nutlets 4 or 5, thin, acute at the ends, irregularly ridged and sometimes grooved on the back, about 9^{mm} in length.

A tree 8 or 9^m in height with a straight trunk sometimes 2^m long and 3^{dm} in diameter, covered with close, light gray bark tinged with red and divided by shallow fissures into small plates, stout ascending branches forming an open irregular often round-topped head, and slender nearly straight branchlets, densely villose when they first appear, dark orange color tinged with red, marked by many oblong pale lenticels, and sparingly villose when the flowers open, bright red-brown and lustrous at the end of their first season, becoming dark dull reddish-brown the following year, and sparingly armed with slender, nearly straight red-brown shining spines 3.5–5^{cm} long. Flowers the middle of May. Fruit ripens from the middle to the end of September.

Open woods or near the borders of streams in moist rich soil, Thatcher's Park, September, 1899, May, August and September 1900, May and September 1901, Glendon Park, October 1900, woods by Desplaines river, River

Forest, May, June and September 1901, *E. J. Hill*; Thatcher's Park, *C. S. Sargent*, September 1900.

This species resembles *Crataegus pedicellata* Sargent, of the valley of the Genesee river in New York, but differs from it in its much more villose corymbs, stouter pedicels, more numerous stamens, and smaller obovate fruits with small closely appressed not erect and incurved calyx-lobes. This is one of the largest and handsomest thorn trees of the region and may properly help to perpetuate the name of its discoverer, Ellsworth Jerome Hill, who with unfailing energy and through many seasons has studied *Crataegus* in the neighborhood of Chicago.

TENUIFOLIAE.

Anthers pink or rose color.

Stamens 5-10, usually 5.

***Crataegus apiomorpha*, n. sp.**—Leaves oblong-ovate, acuminate, rounded or rarely cuneate at the entire often unsymmetrical base, finely doubly serrate above, with slender glandular teeth and slightly divided above the middle into 4 or 5 pairs of nearly triangular acute lobes; about half-grown when the flowers open and then membranaceous, light yellow-green and tinged with red or bronze color, covered above with short white hairs and pale and glabrous below; at maturity thick and firm in texture, dark blue-green and smooth and lustrous or sometimes dull and scabrate on the upper surface, pale blue-green on the lower surface, 4-6 or on leading shoots to 8^{cm} long, 3-4^{cm} wide, with stout midribs deeply impressed on the upper side and primary veins arching obliquely to the points of the lobes; petioles slender, slightly winged at the apex, grooved, often sparingly glandular, 1.5-2.5^{cm} in length; stipules linear, acuminate, glandular, caducous. Flowers 1.2-1.8^{cm} in diameter on short villose or glabrous pedicels, in compact, many-flowered usually hairy thin branched compound corymbs; bracts and bractlets linear to oblong-obovate and rounded at the apex, finely glandular-serrate, with stipitate dark red or purple glands, large, turning red before falling, mostly persistent until after the flowers open; calyx tube narrowly obconic, glabrous, the lobes abruptly narrowed at the base, slender, acuminate, entire or sparingly glandular on the margins, reflexed after anthesis; stamens 5-10, usually 5; anthers pink; styles 3-5, surrounded at the base by tufts of pale

hairs. Fruit obovate or rarely short-oblong, bright reddish purple marked by small scattered pale dots, 1–1.6^{cm} long, 8–12^{mm} wide; calyx sessile, with a broad shallow cavity and spreading lobes, their tips mostly deciduous from the ripe fruit; flesh thin, yellow, juicy, pleasantly acid; nutlets three to five, thin, ridged on the rounded back with a low ridge, 6–8^{mm} long.

A tree 5–8^m in height with a trunk 1–2^m long and 1–2^{dm} in diameter, covered with dark gray bark separating into thin plates, 2–6^{cm} long and 1–2^{cm} wide, in falling disclosing the yellow inner bark, and dividing into several ascending branches forming an oblong or pyramidal crown resembling that of a pear tree; or often shrubby with numerous stems spreading into small clumps; ultimate branchlets rough, zigzag, covered with small twigs, dark dull red-brown and marked by small pale lenticels during their first season, dark gray-brown the following year and unarmed or armed with slender nearly straight dull red-brown ultimately ashy gray spines 3–4^{cm} long. Flowers early in May. Fruit ripens the first of September and soon falls and decays.

Dry open places, wood borders and along the margins of the high banks of streams. Common and generally distributed in the neighborhood of Chicago. Mokena, July 1900. May and September 1901, Barrington, May and September 1901, Glendon Park, May and September 1901, Tinley Park, May and September 1901, Joliet, May and September 1902, *E. J. Hill*; Joliet, *H. C. Skeels*, May 1902, Fort Sheridan, May and September 1902, *E. J. Hill*.

Crataegus cyanophylla, n. sp.—Glabrous except the upper surface of young leaves. Leaves oblong-ovate, acuminate, usually rounded or rarely truncate or cuneate at the broad base, sharply and often doubly serrate, with straight or incurved glandular teeth, and more or less divided into four or five pairs of spreading acuminate lobes; bright bronze-red when expanding; nearly half grown when the flowers open and then membranaceous, pale blue-green tinged with red and roughened on the upper surface by short pale hairs; at maturity thin, smooth, distinctly blue-green, darker on the upper than on the lower surface, 3–6^{cm} long, 2.5–5^{cm} wide, frequently as broad as long, with thin midribs and very slender prominent veins extending to the points of the lobes; petioles slender, slightly grooved, sparingly glandular, 1–3^{cm} in length; stipules linear to oblong-obovate, acute, glandular, turning pink in fading, caducous; leaves on vigorous leading shoots often elliptical, concave-cuneate at the base, long-pointed,

coarsely serrate, more deeply lobed than the leaves of fertile branchlets, 7–8^{cm} long, 5–6^{cm} wide, with stout petioles wing-margined above the middle and 2–4^{cm} long, and foliaceous lunate coarsely glandular-serrate persistent stipules. Flowers 1.2–1.8^{cm} in diameter on slender pedicels in narrow 8–12-flowered thin-branched compound corymbs; bracts and bractlets linear, glandular, mostly deciduous before the flowers open; calyx tube narrowly obconic, the lobes gradually narrowed from the base, acuminate, tipped with minute red glands, entire or occasionally slightly glandular-serrate, reflexed after anthesis; stamens 5–10, usually 5, sometimes only 2 or 3 bearing anthers; anthers small, reddish pink; styles 3–5, generally 4, surrounded at the base by tufts of white hairs. Fruit on slender pedicels, in pendent drooping few-fruited clusters, subglobose to short-oblong, slightly four-angled, abruptly rounded at the ends, dark reddish purple marked by many small pale lenticels, 1–1.6^{cm} long, 9–15^{mm} wide; calyx sessile, with a narrow shallow cavity and slightly serrate erect or incurved lobes, bright red on the upper side below the middle, usually persistent on the ripe fruit, flesh thin, yellow, firm and rather dry, insipid, slightly bitter; nutlets 3–5, usually 4, rounded at the ends, prominently ridged on the back with a broad, often grooved ridge 6–8^{mm} long.

A bushy or occasionally treelike shrub 3–4^m in height with slender stems covered with pale gray bark, often spreading into broad thickets, ascending branches forming an oblong head and thin nearly straight branchlets, light orange-green and marked by many small pale lenticels when they first appear, dull light reddish-brown at the end of their first season, light gray-brown the following year, and armed with numerous dull chestnut-brown ultimately gray mostly short stout curved spines tapering abruptly at the apex, and often only 1.5^{cm} in length, or occasionally slender and 3–3.5^{cm} long. Flowers during the first half of May. Fruit ripens at the end of September or early in October and does not fall until after the leaves or until the beginning of November.

Dry upland pastures on the borders of woods, Mokena, September 1899, May 1900, Bremen and Orland, October 1901, May 1902, Joliet, May and September 1902, Oak Forest, September 1902, *E. J. Hill*; Joliet, *H. C. Skeels*, May 1902.

Crataegus trachyphylla, n. sp.—Leaves oval to elliptical and acuminate, rounded or broadly cuneate, or on leading shoots

rarely subcordate at the entire base, sharply often doubly serrate above, with straight glandular teeth, and slightly divided above the middle into short acuminate spreading lobes; nearly half-grown when the flowers open and then dark blue-green tinged with red and roughened on the upper surface by short rigid white hairs and glabrous to the lower surface; at maturity very thin, dull bluish green and scabrate above, pale bluish green below, 5–6.5^{cm} long, 3.5–5^{cm} wide, often nearly as broad as long, with thin midribs and very slender primary veins extending obliquely to the points of the lobes; petioles slender, grooved, villose on the upper side early in the season, becoming glabrous, glandular, with small red stalked glands, mostly deciduous before autumn; stipules linear, acuminate, often somewhat falcate, glandular, turning reddish before falling, caducous. Flowers 1.8^{cm} in diameter on long slender pedicels, in broad many-flowered thin-branched compound corymbs; bracts and bractlets linear to lanceolate, glandular, turning red in fading, mostly persistent until after the flowers open; calyx tube broadly obconic, glabrous, the lobes slender, acuminate, coarsely glandular-serrate, usually only below the middle, glabrous on the outer, villose on the inner surface, reflexed after anthesis; stamens 5–7, generally 5; anthers pale pink; styles 4 or 5. Fruit drooping on long slender pedicels, in few-fruited clusters, obovate, full and rounded at the apex, gradually narrowed to the base, and often furnished on one side with a basal protuberance, crimson, lustrous, marked by small pale dots, 1.3–1.9^{cm} long and 1.2–1.5^{cm} wide; calyx sessile with a narrow shallow cavity and enlarged coarsely serrate spreading and incurved lobes bright red on the upper side below the middle, often deciduous from the ripe fruit; flesh thin, nearly white, acidulous, juicy; nutlets 4 or 5, thin, acute at the ends, irregularly ridged and often grooved on the back, about 7^{mm} long.

A tree 5^m in height with a trunk 2^m long and 1.5^{dm} in diameter covered with close dark gray bark divided by narrow fissures into numerous thin plate-like scales, ascending branches forming a narrow oblong head, and slender zigzag branchlets, dark orange color and marked by numerous small pale lenticels when they first appear, light orange-brown and very lustrous at the end of their first season, light gray-brown the following year, ultimately ashy

gray, and armed with numerous stout slightly curved light chestnut-brown shining spines 2-4^{cm} in length. Flowers from the 1st to the 10th of May. Fruit ripens the middle of September and soon falls.

Drift hills in clay soil, Mokena, September 26, 1900, May, June and September 1901, and May and September 1902, *E. J. Hill*.

Well distinguished in this group by the shape of the very thin scabrous leaves and pyriform fruits.

CRATAEGUS EGANI Ashe, Jour. Elisha Mitchell Sci. Soc. 17¹:15. 1900.

Bremen, October 1901; Egandale, Highland Park, May, September and October 1902; Highland Park and Tinley Park, May and September 1902, *E. J. Hill*; Mokena, September 1902, *C. S. Sargent*.

Stamens 10.

Crataegus sextilis, n. sp.—Glabrous with the exception of the hairs on the upper surface of the young leaves. Leaves short-ovate, acute, rounded, cuneate, or particularly on vigorous shoots cordate at the wide entire base, finely serrate above, with straight or incurved glandular teeth, and deeply divided into 5 or 6 pairs of spreading acuminate lobes; when they unfold deeply tinged with red, covered above with soft white hairs, and glabrous below; at maturity thin but firm in texture, dull bluish green and scabrate on the upper surface, paler on the lower surface, 3.5-4.5^{cm} long, 3.5-6^{cm} wide, and often wider than long, with slender yellow midribs and thin primary veins extending obliquely to the points of the lobes; petioles slender, often slightly wing-margined at the apex, grooved, sparingly glandular, particularly while young, from 2-3^{cm} in length; stipules linear to lanceolate, glandular, caducous. Flowers 1.3-1.5^{cm} in diameter on long slender pedicels, in compact mostly 10-flowered thin-branched glabrous compound corymbs; bracts and bractlets linear, glandular, small, usually deciduous before the flowers open; calyx tube narrowly obconic, yellow-green, the lobes narrow, acuminate, entire or slightly serrate, sparingly glandular; stamens 10; anthers pink; styles usually 3, surrounded at the base by a broad ring of pale tomentum. Fruit on slender pedicels in drooping few-fruited clusters, subglobose to short-oblong, scarlet, lustrous, 1.2-1.4^{cm} in diameter; calyx sessile, with a narrow shallow cavity and small spreading closely

appressed lobes usually deciduous from the ripe fruit; flesh thick, succulent, yellow; nutlets usually 3, broad, acute at the ends, very prominently ridged on the back, with a high rounded ridge, 7^{mm} long.

A shrub 2-3^m in height, with slender nearly straight branchlets, light yellow-green and marked by many small pale lenticels when they first appear, light red-brown and lustrous at the end of their first season, lighter-colored the following year and ultimately ashy-gray, and unarmed or armed with rather stout straight or slightly curved red-brown shining spines 1-3^{cm} in length; winter-buds globose covered with bright red shining scales, only 2^{mm} in diameter. Flowers about the middle of May. Fruit ripens from the 20th of August to the 1st of September, and immediately falls and decays.

Near Lake Zurich, September 1899, May and September 1901; Thatcher's Park, May, August and September 1900, May and August 1901; Maywood, August 1900, May and August 1901; Beverly Hills, June and August 1901, June 1902; Oak Forest, September 1902, *E. J. Hill*.

Well distinguished from the other species of this group in Illinois by the early ripening fruit which matures and drops a few days before the fruit of *Crataegus mollis* Scheele, ripens in the same region.

***Crataegus paucispina*, n. sp.**—Leaves oblong-ovate, acuminate, rounded, concave-cuneate to truncate or subcordate at the entire base, sharply doubly serrate above, with straight glandular teeth and deeply divided into 4 or 5 pairs of acute lateral lobes spreading or pointing toward the apex of the leaf; about half-grown when the flowers open, and then light yellow-green and slightly roughened above by short white hairs and paler and glabrous below; at maturity membranaceous, dark blue-green and scabrate on the upper surface, light blue-green on the lower surface, 6-8^{cm} long, 4-6^{cm} wide, with slender yellow midribs and thin primary veins extending obliquely to the points of the lobes; petioles slender, slightly grooved, usually destitute of glands, tinged with purple in the autumn, 2-4^{cm} in length; stipules linear, acuminate, glandular, with large dark glands, reddish, caducous. Flowers 1.5-1.8^{cm} in diameter on slender pedicels covered with broad spreading hairs, in broad 12-20-flowered thin-branched slightly villose compound corymbs; bracts and bractlets linear to oblong-obovate, glandular, red, mostly persistent until after the flowers open; calyx tube narrowly obconic, glabrous, dull green, the lobes narrow,

acuminate, glandular-serrate, with small dark red stipitate glands, glabrous on the outer, pubescent on the inner face, reflexed after anthesis; stamens 10; anthers bright reddish-purple; styles 4 or 5, surrounded at the base by tufts of pale hairs. Fruit on slender glabrous pedicels in drooping clusters, pyriform to globose-pyriform, crimson or purplish, marked by many small pale dots, slightly pruinose, 1.2–1.7^{cm} long, 1.2–1.5^{cm} wide; calyx small, with an arrow deep cavity and reflexed and appressed or erect and incurved serrate lobes, dark red on the upper side below the middle, often wanting from the ripe fruit; flesh thin, yellow, juicy, acid and edible; nutlets 4 or 5, thin, acute at the ends, rounded and slightly grooved or obscurely ridged on the back, 6–7^{mm} long.

A tree 5–8^m in height with a trunk 1.5–2^m long and 1–1.5^{dm} in diameter, covered with dark gray or blackish bark, separating into thin plate-like scales, numerous branches forming a round-topped head and slender zigzag branchlets, dark yellow-green and marked by many small pale lenticels when they first appear, dark dull reddish-brown at the end of their first season, olive gray in their second year, and ultimately dark gray-brown, and armed with small straight light red-brown shining spines usually only about 1.8^{cm} in length; winter-buds subglobose to short-oblong, large and conspicuous, 3–4^{mm} in diameter, covered with dark chestnut-brown lustrous scales slightly scarious on the margins. Flowers early in May. Fruit ripens from the 8th to the 15th of September and soon falls.

Woods and river banks in dry clay soil, Maywood, September 1899, May 1900, September 1901, May and September 1902, *E. J. Hill* and *C. S. Sargent*, September 1901.

Stamens usually 20.

Crataegus tarda, n. sp. — Leaves broadly ovate, acuminate, cuneate or rounded or rarely truncate at the wide base, sharply often doubly serrate, with straight glandular teeth and divided into 4 or 5 pairs of short broad acute lobes; about half-grown when the flowers open and then membranaceous, pale green more or less tinged with red and roughened above by short pale hairs, glabrous below, at maturity thin but firm to subcoriaceous, dark bluish green and smooth or scabrate on the upper surface, pale on the lower surface, 4–7^{cm} long, 4–6^{cm} wide, sometimes broader than long, with slender prominent midribs and thin but conspicuous primary veins arching obliquely to the points of the

lobes; petioles slender, wing-margined at the apex, grooved, glandular, with numerous dark glands, mostly deciduous before autumn, 2.5–3^{cm} in length; stipules oblong-obovate rounded at the apex, glandular, tinged with red, large and conspicuous, usually persistent after the flowers open. Flowers 1.8–2.4^{cm} in diameter on slender glabrous or sparingly villose pedicels in 8–12-flowered thin-branched compound corymbs; bracts and bractlets lanceolate to oblong-obovate, acute, glandular; calyx tube broadly obconic, pale green, pubescent to glabrate, the lobes gradually narrowed from the base, wide, elongated, tipped with minute dark glands, finely glandular-serrate, glabrous on the lower, puberulous on the upper surface; stamens 10–20, usually 20; anthers pinkish purple; styles 3–5, usually 5, surrounded at the base by tuft of white hairs. Fruit on short glabrous pedicels, in compact few-fruited drooping clusters, oblong to subglobose, bright scarlet marked by numerous small pale lenticels, becoming crimson and soft and succulent when fully ripe, 1.2–1.6^{cm} long, 1.1–1.4^{cm} wide; calyx sessile, with a narrow shallow cavity and enlarged serrate spreading or erect lobes mostly deciduous from the ripe fruit; flesh thin, sweet, yellow; nutlets 3–5, usually 4 or 5, thin, acute at the ends, prominently ridged, with a thin narrow ridge or sometimes rounded and slightly grooved on the back.

A shrub 2–3^m in height with numerous small stems forming narrow-topped bushes, or when growing in the woods under the shade of other trees sometimes arborescent in habit with a well developed trunk and 4–5^m tall; branchlets stout, slightly zigzag, dark orange-green marked by many small lenticels when they first appear, bright red-brown and lustrous at the end of their first season, dark gray or gray-brown the following year, and armed with many very stout slightly curved abruptly pointed bright chestnut-colored shining ultimately gray spines 2–5^{cm} long. Flowers early in May. Fruit ripens at the end of September or early in October and remains on the branches with the leaves for another month.

Upland pastures, the borders of woods and the high banks of streams usually in hard clay soil, Barrington, June and September 1899, May 1901, Chicago Heights, May and October 1901, Orland, October 1901, May 1902, Mokena, May and September 1902, *E. J. Hill*.

Resembling superficially *Crataegus cyanophylla*, *Crataegus tarda* differs from that species in its soft succulent fruit, in its more numerous stamens, and in the usually broader and thicker light green leaves.

CRATAEGUS FERRISSI Ashe, Jour. Elisha Mitchell Sci. Soc. 17²:11. 1901.

Highland Park, May, September and October 1902, *E. J. Hill*.

CRATAEGUS LUCORUM Sargent, BOT. GAZ. 31:227. 1900; Silva N. Am. 13:125. *pl.* 679.

Banks of sloughs near Barrington; Fort Sheridan, *E. J. Hill*. May and September 1902.

COCCINEAE.

Stamens 10.

Anthers pale yellow.

CRATAEGUS PRAECOQUA Sargent, Rhodora 5:—. 1903.

Crataegus praecox Sargent, Rhodora 3:27. 1901 (not *Crataegus Oxycantha praecox* Loudon).

Wildwood, August 1894, May 1896, May, July and September 1899, September 1900; Barrington, May, June and September 1899; Glenwood, May, June and September 1899, May 1901; Glendon Park, May, August and September, *E. J. Hill*, 1900; Glendon Park, *C. S. Sargent*, September 1899.

Crataegus subrotundifolia, n. sp.—Leaves rhombic to broadly ovate, acute or acuminate at the apex, cuneate or rounded below, finely and often doubly serrate, with straight or incurved gland-tipped teeth, and divided above the middle into 3 or 4 pairs of short acute lobes; more than half-grown when the flowers open and then membranaceous, light yellow-green and covered on the upper surface with long white hairs and paler and glabrous on the lower surface, at maturity thin but firm in texture, glabrous, dark green and lustrous above, light yellow-green below, 3.5–4^{cm} long, 2.5–4.5^{cm} wide, often wider than long, with stout midribs and 3 or 4 pairs of prominent primary veins extending very obliquely to the points of the lobes; petioles stout, usually wing-margined 'to below the middle, deeply grooved, glandular with numerous dark glands mostly deciduous before autumn, often bright rose color late in the season on the lower side like that of the base of the midribs, 1–2^{cm} in length; stipules linear, glandular, reddish, caducous; on vigorous shoots leaves sometimes oblong-ovate, more deeply lobed and more coarsely serrate than on fertile branchlets, concave-cuneate below and gradually narrowed into the broadly winged petioles, 5.5–6^{cm}

long, 4-5^{cm} wide. Flowers 1.5-1.6^{cm} in diameter on long slender slightly hairy pedicels, in 7-10-flowered compact thin-branched compound corymbs; bracts and bractlets linear to oblong-obovate, acute or rounded at the apex, glandular, with large dark red glands, reddish, large and conspicuous, mostly persistent until after the flowers open; calyx tube broadly obconic, the lobes gradually narrowed from the base, wide, elongated, acuminate, glandular-serrate, with stipitate light red glands, glabrous on the outer, densely villose on the inner face, reflexed after anthesis; stamens 10; anthers pale yellow; styles 2-4, usually 3, surrounded at the base by a broad ring of pale tomentum. Fruit on slender glabrous or slightly hairy pedicels, in drooping few-fruited clusters, short-oblong, full and rounded at the ends, dark crimson, marked by many large pale dots, 1.6-1.8^{cm} long, about 1.5^{cm} wide; calyx sessile, with a broad shallow cavity and spreading serrate lobes villose on the upper side; flesh thick, yellow, dry and mealy; nutlets 2-4 broad, full and rounded at the ends, prominently ridged on the back, with a very high wide deeply grooved ridge, 7^{mm} long.

A shrub 2 to 3^m tall, with numerous stems spreading into small thickets, or rarely a small bushy tree 5^m in height, with a broad spreading top; branchlets slender, zigzag, dark orange-green and marked by oblong pale lenticels when they first appear, light red-brown and lustrous during their first season, becoming light or dark gray-brown the following year, and armed with numerous stout straight or slightly curved bright chestnut brown shining spines 2.5-5^{cm} in length. Flowers about the middle of May. Fruit ripens the first of October.

Shores of Lake Zurich, May, September and October 1901; dry woods near Honey Lake, Lake county, October 1901, *E. J. Hill*.

This addition to the COCCINEA group differs from *Crataegus coccinea rotundifolia* Sargent, of the St. Lawrence valley and the northeastern states in its thinner and usually smaller leaves villose while young on the upper surface by the villose covering on the upper side of the calyx-lobes, and by its usually smaller fruits.

TOMENTOSAE.

Stamens 20.

Anthers rose color or pink.

CRATAEGUS TOMENTOSA Linnaeus.

Common.

Crataegus vegeta, n. sp.—Leaves elliptical, acuminate, gradually narrowed and concave-cuneate at the entire base, finely often doubly serrate above, with straight glandular teeth, and slightly divided above the middle into numerous short acute lobes; nearly fully grown when the flowers open and then membranaceous, dark yellow-green and roughened above by short rigid pale hairs, and densely pubescent below; at maturity thin but firm in texture, dark dull green and scabrate on the upper surface, pale and pubescent on the lower surface along the slender midribs and 5 or 6 pairs of thin primary veins arching obliquely to the points of the lobes, 7.5–10^{cm} long, 4.5–6^{cm} wide; petioles slender, broadly wing-margined at the apex by the decurrent base of the leaf-blades, grooved, villose on the upper side early in the season, becoming glabrous and rose color in the autumn, 1.5–2^{cm} in length; stipules linear, acuminate, rose color, small, caducous. Flowers 1.5–1.8^{cm} in diameter on long slender villose pedicels, in usually 10–12-flowered thin-branched hairy compound corymbs; bracts and bractlets linear to linear-obovate, acute, glandular, becoming reddish before falling, mostly persistent until after the flowers open; calyx tube narrowly obconic, villose like the slender acuminate glandular-serrate lobes, reflexed after anthesis; stamens 20; anthers small, light pink or red; styles 2 or 3, usually 3. Fruit on slender elongated rigid slightly villose pedicels, in few-fruited erect clusters, subglobose, scarlet, lustrous, marked by small, pale dots, 9–10^{mm} in diameter; calyx prominent with a short tube, a narrow deep cavity, and spreading reflexed serrate lobes; flesh thin, yellow, dry and mealy; nutlets 2 or 3, full and rounded at the ends, 6^{mm} long and nearly as broad, prominently ridged on the back, with a high grooved ridge, the dorsal cavities broad and deep.

A tree 7–8^m in height with a tall straight trunk sometimes 2^{dm} in diameter, stout wide-spreading branches forming a symmetrical round-topped head, and very slender nearly straight branchlets light orange-green and marked by many large pale lenticels when they first appear, bright red-brown and lustrous at the end of their first season, darker the following year, and unarmed or sparingly armed with slender nearly straight dark purple shining spines about 4^{cm} in length; winter-buds ovate to subglobose, light chestnut color, lustrous, 4–5^{mm} long, their inner scales accrescent, bright red and very

conspicuous as the leaves unfold. Flowers at the end of May. Fruit ripens late in September.

Oak woods in moist rich soil near the bank of the Calumet river, at Calumet, *E. J. Hill*, May 27 and September 27 1901; *C. S. Sargent*, September 1901.

Crataegus Gaultii, n. sp.—Leaves elliptical to suborbicular, acute or rounded at the apex, concave-cuneate or rounded at the entire base, coarsely doubly serrate above, with straight glandular teeth, and occasionally slightly divided above the middle into short acute lobes; nearly fully grown when the flowers open and then very thin, light yellow-green and sparingly villose above, pale and slightly pubescent below; at maturity thin but firm in texture, glabrous, dark dull green on the upper surface, pale on the lower surface, 6–9^{cm} long, 5–7^{cm} wide, with stout yellow midribs deeply impressed above and 6 or 7 pairs of primary veins extending obliquely to the points of the lobes; petioles stout, wing-margined usually to below the middle by the decurrent base of the leaf-blades, villose on the upper side early in the season, with matted white hairs, becoming nearly glabrous, 1–2^{cm} long; stipules linear to linear-falcate, acuminate, glandular, with minute bright red stipitate glands, caducous. Flowers 1–5^{cm} in diameter on long slender slightly villose pedicels, in broad many-flowered thin-branched hairy compound corymbs with 3-flowered peduncles from the axils of the two upper leaves; bracts and bractlets linear, acuminate, glandular, turning red in fading, mostly persistent until the flowers open; calyx tube narrowly obconic, the lobes broad, acuminate, coarsely glandular-serrate, glabrous on the outer, villose on the inner face; stamens 18–20; anthers pale pink; styles 2 or 3. Fruit drooping on slender slightly hairy pedicels, in few-fruited clusters, subglobose to short-oblong, 1.2–1.4^{cm} in length; calyx sessile, with a broad deep cavity and spreading and appressed coarsely serrate lobes; flesh thick, yellow, soft and juicy; nutlets 2 or 3, full and rounded at the ends, about 1.2^{cm} long and nearly as wide, full and rounded on the back, with a high rounded ridge, the ventral cavities long, deep and narrow.

A tree 7–8^m in height with a trunk sometimes 2^m long and 2.5^{dm} in diameter, spreading branches forming a broad round-topped head, and slender

slightly zigzag branchlets light yellow-green when they first appear, rather light red-brown, lustrous, and marked by many large pale lenticels at the end of their first season, becoming lighter-colored the following year and unarmed or armed with occasional straight slender dark purple shining spines 3–4 cm in length. Flowers at the end of May. Fruit ripens from the middle to the end of September.

Open pastures, Milton Township, Du Page county, *B. T. Gault*, May and September 1902; Glen Ellyn, June 1902, bluff-like banks of Hickory creek, Mokena, *E. J. Hill*, October 1900, May and June 1901.

Specimens collected by Dr. Hill at Mokena have smaller and rounder leaves, glabrous on the lower surface when the flowers open but otherwise very similar to those gathered by Mr. Gault in Milton which must be considered the type of this species.

***Crataegus longispina*, n. sp.**—Leaves ovate to rhombic, acute or acuminate, gradually narrowed and cuneate at the entire base, coarsely and doubly serrate above, with straight gland-tipped teeth, and irregularly divided above the middle into short broad acute lobes; when the flowers open membranaceous, dark yellow-green, lustrous, and covered above with soft pale hairs, lighter-colored and slightly hairy along the midribs and veins below, at maturity very thick and coriaceous, dark yellow-green, lustrous, smooth and glabrous on the upper surface, light yellow-green and still slightly pubescent on the lower surface along the thick yellow midribs and 5 or 6 pairs of slender prominent primary veins, 6–8 cm long, 4–6 cm wide; petioles stout, wing-margined at the apex by the decurrent base of the leaf-blades, grooved, villose on the upper side, becoming glabrous, usually tinged with purple in the autumn like the lower part of the midribs; stipules linear, acuminate, glandular, small, caducous. Flowers about 1.2 cm in diameter on very long slender slightly hairy pedicels, in broad many-flowered thin branched villose compound corymbs; bracts and bractlets linear to linear-obovate, acuminate, elongated glandular with minute dark red stipitate glands, conspicuous, generally persistent until the flowers open; calyx tube narrowly obconic, villose toward the base, glabrous above, the lobes narrow, acuminate, coarsely glandular-serrate, glabrous on the outer, sparingly villose on the inner surface; stamens 20; anthers pale pink; styles 2 or 3. Fruit on stout glabrous red pedicels, in large many-fruited drooping clusters, subglobose,

usually slightly wider than high, scarlet, lustrous, marked by few small dots 8–10^{mm} in diameter; calyx prominent, nearly sessile, with a narrow deep cavity and enlarged coarsely serrate reflexed and closely appressed lobes villose on the upper side, and usually persistent on the ripe fruit; flesh thin, yellow, dry and mealy, not becoming succulent; nutlets 2 or 3, full and rounded at the ends, 6^{mm} long, 7^{mm} wide, rounded and prominently grooved on the back, with a wide doubly grooved ridge, the ventral cavities broad and deep.

A shrub 1–2^m in height with stout branchlets, dark reddish-brown and marked by large pale lenticels when they first appear, light red-brown and very lustrous at the end of their first season, rather darker-colored and still lustrous the following year, and armed with numerous very stout nearly straight dark purple shining spines 6–9^{cm} long.

Sandy shores of Lake Zurich, *Hill* and *Sargent*, September 22, 1900, *E. J. Hill*, May and October 1901.

Crataegus rutila, n. sp.—Leaves broadly ovate to oval or suborbicular, rounded or abruptly narrowed and acute at the apex, rounded, concave-cuneate or rarely slightly cordate at the wide entire base, sharply and doubly serrate above, with straight glandular teeth, and divided above the middle into numerous small acuminate lobes; more than half-grown when the flowers open and then membranaceous, dark yellow-green, very smooth and glabrous above with the exception of numerous short white deciduous hairs on the upper side of the midribs, and pale and slightly pubescent or nearly glabrous below; at maturity subcoriaceous, dark yellow-green on the upper surface, light yellow and glabrous or puberulous on the lower surface, 4.5–7.5^{cm} long, 4.5–6.5^{cm} wide, with very stout yellow midribs deeply impressed above, 5 or 6 pairs of prominent primary veins, and thick conspicuous reticulate veinlets; petioles stout, wing-margined often to the middle by the decurrent base of the leaf-blades, covered on the upper side early in the season with short soft hairs, becoming glabrous, often tinged with purple in the autumn, 1–2.5^{cm} in length; stipules linear, acuminate, glandular, with small stipitate red glands, caducous. Flowers about 1.5^{cm} in diameter on long slender sparingly villose pedicels, in broad compact many-flowered thin-branched nearly glabrous compound

corymbs; bracts and bractlets linear to oblong-ovate, acuminate, glandular and usually persistent until after the flowers open; calyx tube broadly obconic, glabrous, the lobes wide, acuminate coarsely glandular-serrate, glabrous on the outer, villose on the inner surface, reflexed after anthesis; stamens 20; anthers pink; styles 2 or 3, usually 2, surrounded at the base by small tufts of white hairs. Fruit drooping on slender glabrous pedicels, in few or many-fruited clusters, subglobose, orange-red, marked by occasional large pale dots, becoming crimson and lustrous when fully ripe, 8–10^{mm} in diameter; calyx prominent with a broad deep cavity and spreading and closely appressed lobes; flesh thin, yellow, soft and succulent; nuts usually 2, full and rounded at the ends, 6–7^{mm} long, often 5^{mm} wide, prominently ridged on the back, with a broad deeply grooved ridge, the ventral cavities very oblique, broad and deep.

A shrub or small tree sometimes flowering when not more than 1^m in height, with rather stout nearly straight branchlets, light orange-green and marked by small pale lenticels when they first appear, bright reddish brown and lustrous at the end of their first season, dark reddish brown the following year, and unarmed or armed with occasional stout nearly straight dark purple shining spines about 2.5^{cm} in length. Flowers from the 20th to the end of May. Fruit ripens from the first to the middle of October.

Pastures, Mokena, September and October 1900, May and June 1901, bluff bank of Thorn creek, Chicago Heights, May and October 1901, *E. J. Hill*; shores of Lake Zurich, *C. S. Sargent*, September 1900; Milton Township, Du Page county, *B. T. Gault*, May and September 1902.

Anthers pale yellow.

***Crataegus laxiflora*, n. sp.**—Leaves obovate to ovate-oblong on leading shoots, acuminate, acute or broad and rounded at the apex, mostly gradually narrowed from near the middle to the rounded or cuneate entire base, sharply and doubly serrate above, with straight gland-tipped teeth, and divided toward the apex into 3 or 4 pairs of short acute lobes; about half-grown when the flowers open and then membranaceous, dark yellow-green, lustrous, smooth and glabrous with the exception of a few deciduous hairs near the base of the midrib on the upper surface, light yellow-green and glabrous on the lower surface; at maturity coriaceous, dark green and very lustrous

above, light yellow-green below, 4–7^{cm} long, 3–4^{cm} wide, with stout yellow midribs and thin prominent primary veins extending obliquely to the points of the lobes; petioles stout, grooved, slightly wing-margined at the apex, pubescent on the upper side early in the season, soon glabrous, often tinged with red in the autumn, 1.5–2^{cm} in length. Flowers about 1^{cm} in diameter on long slender pedicels, in broad many-flowered thin-branched very lax villose compound corymbs; bracts and bractlets oblong-obovate to linear, acuminate, glandular, turning red in fading, generally deciduous before the flowers open; calyx tube narrowly obconic, thickly covered with long matted or spreading white hairs, the lobes broad, acuminate, coarsely glandular-serrate, with minute bright red stipitate glands, glabrous on the outer, slightly villose on the inner surface, reflexed after anthesis; stamens 18–20; anthers small, pale yellow; styles 2. Fruit on elongated slender glabrous pedicels, in long many-fruited gracefully drooping clusters, subglobose to short-oblong, bright orange-red, lustrous, marked by occasional large pale lenticels, about 8^{mm} in diameter; cavity of the calyx deep and narrow, the lobes early deciduous, leaving a ring-like border to the long tube; flesh thin, yellow, sweet, dry and mealy, hardly becoming soft and succulent; nutlets 2, full and rounded at the ends, 6^{mm} long, 5–6^{mm} wide, prominently grooved on the back, with a wide doubly grooved ridge; ventral cavities very broad and deep, extending nearly the entire length of the nutlet.

A small tree 3–8^m high, with slender slightly zigzag branchlets, light orange-green and glabrous when they first appear, bright red-brown, very lustrous and marked by occasional small dark lenticels at the end of their first season, becoming darker the following year, and armed with numerous slender straight bright purple shining spines 3–4^{cm} in length. Flowers during the last week of May. Fruit ripens the middle of October.

Banks of the north branch of Hickory Creek at Marley, September 1895, May and October 1897; upland pastures, Mokena, September and October 1900, May and September 1901, *E. J. Hill*.

Stamens 10 or fewer.

Anthers pink.

Crataegus divida, n. sp.—Leaves oblong-ovate, concave-cuneate or rounded at the gradually narrowed entire base,

coarsely doubly serrate above, with straight gland-tipped teeth, and very slightly and irregularly divided above the middle into small acute lobes; more than half-grown when the flowers open and then dark green and roughened above by shining white hairs, and paler and glabrous below; at maturity thin but firm in texture, light bluish-green and scabrate on the upper surface, pale on the lower surface, 5.5–8^{cm} long, 4.5–5.5^{cm} wide, with slender yellow midribs deeply impressed on the upper side, and 5 or 6 pairs of thin primary veins extending very obliquely to the points of the lobes; petioles stout, wing-margined at the apex, grooved, sparingly villose early in the season, becoming glabrous and dark purple, glandular with minute scattered dark glands, 2.5–3^{cm} in length. Flowers 1.5–2^{cm} in diameter on long slender pedicels, in broad many-flowered thin-branched glabrous compound corymbs; bracts and bractlets linear, acuminate, slightly glandular, reddish, mostly deciduous before the flowers open; calyx tube broadly obconic, glabrous, the lobes abruptly narrowed at the base, wide, acuminate, tipped with minute red glands, coarsely glandular-serrate, glabrous on the outer and villose on the inner face; stamens 5–10; anthers pink; styles 2 or 3. Fruit on glabrous red pedicels in drooping few-fruited clusters, short-oblong to subglobose, crimson, lustrous, marked by small pale lenticels, 1–1.2^{cm} in diameter; calyx prominent with a broad deep cavity and much enlarged coarsely serrate spreading lobes, dark red on the upper side below the middle, slightly villose toward the apex, generally persistent on the ripe fruit; flesh thin, yellow, soft and succulent; nutlets 2 or 3, full and rounded at the ends, 7^{mm} long, 6^{mm} wide, prominently ridged on the back, with a broad high deeply grooved ridge, the ventral cavities broad and shallow.

A small round-headed tree, 4–5^m in height, with slender nearly straight branchlets, light orange-green and marked by small pale lenticels when they first appear, light reddish-brown and very lustrous at the end of their first season, and gray or light reddish-brown the following year, and armed with few very stout slightly curved bright chestnut-brown shining spines 3.5–4^{cm} long. Flowers about May 20th. Fruit ripens early in October, but is apt to wither on the tree.

Borders of woods on clay hills near Barrington, May, June and Septem-

ber 1899, Barrington village, May, June and September 1899, and May and October 1901, *E. J. Hill*.

Anthers light yellow.

Crataegus corporea, n. sp.—Leaves rhombic, acute at the apex, concave-cuneate at the entire base, finely serrate above, with straight gland-tipped teeth and usually slightly divided above the middle into several short broad acute lobes, about half-grown when the flowers open and then membranaceous, dark yellow-green and sparingly villose above, pale and glabrous below; at maturity subcoriaceous, glabrous, smooth and dark bluish green on the upper surface, light yellow-green on the lower surface, 5–7^{cm} long, 4.5–6^{cm} wide, with stout yellow mid-ribs deeply impressed on the upper side and five or six pairs of prominent primary veins; petioles stout, wing-margined toward the apex, deeply grooved, slightly villose on the upper side early in the season, soon glabrous, 1–1.8^{cm} in length. Flowers 1.5^{cm} in diameter on long slender pedicels, in broad many-flowered thin-branched slightly villose compound corymbs; bracts and bractlets linear, acuminate, glandular, mostly deciduous before the flowers open; calyx tube broadly obconic, glabrous, the lobes wide, acuminate, coarsely glandular-serrate, with small stipitate bright red glands, glabrous on the outer, villose on the inner face, reflexed after anthesis; stamens 5–10; anthers pale yellow, surrounded at the base by small tufts of pale hairs. Fruit on stout dark red glabrous pedicels in many-fruited drooping clusters, subglobose, dark reddish purple, lustrous, marked by occasional pale dots, becoming very soft and succulent when fully ripe, and 1.5–2^{cm} in diameter; calyx prominent, with a broad deep cavity and spreading and closely appressed lobes villose and dark red on the upper side, often deciduous from the ripe fruit; flesh thick, yellow, sweet and juicy; nutlets 2 or 3, full and rounded at the ends, about 7^{mm} long and 6^{mm} wide, ridged on the rounded back, with a low wide ridge, the ventral cavities short and deep.

A shrub with slender stems 1–2^m in height, spreading into small thickets, and stout slightly zigzag branchlets light reddish-brown and marked by large pale lenticels when they first appear, light red-brown and very lustrous at

the end of their first season, darker and still lustrous the following year, and ultimately gray tinged with red, and armed with stout nearly straight dark purple shining spines 7-9^{cm} long. Flowers from the 20th to the end of May. Fruit ripens at the end of September.

Gravelly shores of Lake Zurich, *Hill* and *Sargent*, September 22, 1900; *E. J. Hill*, May and September 1901.

ARNOLD ARBORETUM,
Jamaica Plain, Mass.